

# THE MEDICAL NEWS AND LIBRARY.



VOL. XXIV.

MARCH, 1866.

No. 379.

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### CHOLERA.

*Notes on the Pathology and Treatment of Cholera.* By GEORGE JOHNSON, M. D., F. R. C. P., Professor of Medicine in King's College, &c. (Continued from p. 20.)

In previous communications, I have adduced some facts and arguments adverse to the commonly received theory that the worst symptoms of cholera are mainly due to the drain of water from the blood by vomiting and purging. If this theory be erroneous, it is of incalculable importance that it should be discarded; for it is unquestionable that it has had immense influence on the treatment of cholera, as well as on the estimate which men have formed of the effect of various modes of treatment. Let a practitioner be thoroughly persuaded that the essential cause of choleraic collapse is a drain of liquid from the blood, and it will be difficult to convince him that opium and astringents can do harm, or that an

emetic or a purgative can do anything but harm in the treatment of that disease.

A recent writer in the *Lancet* (Oct. 21st, p. 461) says: "Were we a cholera-patient, we should pray to be delivered from men who have only one idea." Yet it is manifest that this writer is of the class from which he would pray to be delivered. His one idea is, that the secretions are suppressed "for want of serum; and that by supplying the materials of this, and by the use of means that shall act astringently, we are taking the best means to restore secretions." What does it avail to refer one, whose mind is thus prepossessed by a theory, to such facts as are contained in the very interesting paper by Mr. Watkins, published in a recent number of the *British Medical Journal* (Oct. 28th, p. 445)? Mr. Watkins there states that, in 1854, the deaths under various modes of treatment, but mostly with opium, having been more numerous than the recoveries, at a period, too, when

Published monthly by HENRY C. LEA, Philadelphia, for One Dollar a year; also, furnished GRATUITOUSLY to all subscribers of the "American Journal of the Medical Sciences," who remit the Annual Subscription, Five Dollars, in advance, in which case both periodicals are sent by mail free of postage.

In no case is this periodical sent unless the subscription is paid in advance.

"the epidemic was increasing both in the number of cases and in severity," he treated twenty-one cases by repeated doses of castor oil; and, of the cases thus treated, nineteen recovered. About the same period, his colleague, Dr. Lett,<sup>1</sup> treated seven cases by full doses of opium, and "every case had died." What will be said of facts like these by a man whose one idea of the treatment of cholera is, that loss of fluid is to be counteracted by astringents? He will probably argue, that those who recovered while taking purgatives did so in spite of an erroneous and a mischievous treatment; while those who died under the opiate treatment succumbed to the disease in spite of a treatment which was theoretically correct, and which ought, therefore, to have saved them.

I am convinced, from a careful study of the history and literature of cholera, that there will be no general agreement as to the treatment of the disease until we have freed ourselves from erroneous theories as to its pathology and the relation of its symptoms to each other. With this conviction, I purpose now to set forth, as clearly yet as briefly as I am able, certain facts and conclusions regarding the pathology of cholera which appear to me to be well established.

That the symptoms of cholera result from a morbid poison, which may enter the blood either through the lungs or through the gastro-intestinal canal, is a point so generally admitted, that I will not now stop to discuss the question, or to adduce any of the numerous facts upon which this view is based.

The most constant and characteristic effect of this poison is to excite a copious secretion from the mucous membrane of the stomach and bowels. This secretion is tinged with bile *before* collapse comes on, and again *after* collapse has passed off; while during the stage of collapse it has the characteristic rice-water appearance, and bile can be detected only by chemical tests. The vomiting and purging constitute the means by which the morbid secretions are eliminated from the alimentary canal.

It is certain that the cholera stools contain some poisonous materials by which the disease may be communicated. One fact confirmatory of this view is the frequency

<sup>1</sup> The case of Dr. Lett himself is one of peculiar and most painful interest.

with which washerwomen and their families have suffered from coming into contact with the soiled linen of cholera patients. It is probable, therefore, that the poison is eliminated through the gastro-intestinal canal. It is also probable that the secretion from the mucous membrane of the digestive canal, together with the vomiting and purging, are as much parts of the natural process of cure as is the eruption on the skin in the case of smallpox. This, at any rate, is certain, that, as no patient ever yet recovered from smallpox without the appearance of the characteristic eruption, so no sufferer from cholera was ever known to get well without more or less of vomiting and diarrhoea.

As, in the worst and most malignant forms of smallpox, the patient may die of blood-poisoning before the rash appears, so, in the worst and most malignant cases of cholera, he may die of collapse without either vomiting or purging, or with little of either. There is no direct relation, as we have seen (see pp. 1, 2), between the degree of collapse and the amount of vomiting and purging—sometimes rather an inverse ratio between them.

There is yet one more point of analogy between smallpox and cholera. As the variolous eruption, which is unquestionably curative, may yet by its very abundance be fatal through its destructive influence on the skin, so the choleraic secretions may be so copious as to kill by exhaustion. Death by exhaustion is certainly not a common result of cholera; yet with the known possibility of such a result, a rational eliminative treatment, while it endeavours to free the stomach and bowels from the morbid secretions which have been spontaneously poured into them, makes no direct attempt to increase the amount of excretion from the blood.

It has been suggested by some writers, that the analogy of smallpox and its treatment affords an argument against the eliminative treatment of cholera. It is said, with truth, that when the treatment of smallpox was conducted on the theoretical principle of assisting the development of the pustules and so the elimination of the poison, by keeping the patient in a close and heated atmosphere, the mortality of the disease was much increased. It would have been strange indeed if the mortality had not been increased by such a mode of

treatment; but it is a result of shallow observation and reasoning, to infer that there is any analogy between that mode of treating smallpox and the use of emetics and purgatives in cholera. The unhappy sufferer from smallpox, who was covered with heaps of bed-clothes and confined in an artificially heated atmosphere, with closed doors and windows, was not only deprived of the refreshing influence of cool and pure air; but he was compelled to inhale again through his lungs the morbid poison which had escaped from his skin. This treatment was the exact opposite of eliminative. To eliminate is to put *à limine*, or out of door; but this irrational treatment rendered elimination impossible by closing the doors and windows through which the poison might have escaped.

So far from there being any analogy between this destructive mode of treating smallpox and the treatment of cholera by emetics and purgatives, the analogy would be much closer with an opposite mode of treatment—one by which a patient should be made to swallow his own evacuations, or one which approaches very near to this in its results; namely, that which has for its object to restrain the evacuations by opium and astringents, thus increasing the risk of the morbid secretions being reabsorbed into the blood.

There is no known cure for cholera—there probably never will be; but, as the cooling treatment of smallpox which, in spite of violent opposition, was first introduced by Sydenham, materially lessened the mortality from that terrible disease, so the general adoption of an eliminative treatment of cholera—by means of emetics, mild purgatives, and copious draughts of water—would, I am persuaded, do much to lessen the mortality from this great modern scourge.

The analogy of smallpox and the results of the two opposite modes of treating that disease, are certainly in favour of, and not opposed to, this view, as some writers have too hastily assumed.

In my next communication, I shall endeavour to explain the symptoms of that remarkable condition which we know by the name of choleraic collapse.

*The symptoms and pathology of collapse.*—The symptoms of choleraic collapse are so well known as to need no minute description. The most important and cha-

racteristic of them are the following. Coldness and blueness of the skin; great diminution of the volume and force of the pulse; shrinking of the features, with a corpse-like sinking of the eyeballs; more or less hurry and difficulty of breathing, with a short dry cough; a peculiar feebleness of the voice; coldness of the tongue and breath; a sensation of burning heat in the epigastric region; great thirst; more or less complete suppression of bile and urine; vomiting and purging of a rice-water fluid; torpor and drowsiness in a variable degree, but without delirium; and, lastly, cramps in the muscles. Most of these symptoms are present in every case of collapse; some, however, may be absent.

What is the pathological explanation of this remarkable train of symptoms? The one great central fact is this, that, *during the stage of collapse, the passage of blood through the lungs from the right to the left side of the heart is, in a greater or less degree, impeded.* Let us now consider the evidence of there being this impediment to the pulmonary circulation; and let us endeavour to ascertain the probable cause and consequences of this obstruction to the flow of blood. Very conclusive evidence as to the existence of impeded pulmonary circulation during life is afforded by the appearances observed in the heart, bloodvessels, and lungs after death. The *post mortem* appearances within the chest have been described, with more or less minuteness, by several authors; but by no one, I believe, with so much care and accuracy as by Dr. Parkes. (*Researches on the Pathology and Treatment of the Asiatic or Algid Cholera.*)

In the great majority of cases in which death has occurred during the stage of collapse, the right side of the heart and the pulmonary arteries are filled, and sometimes distended, with blood; while the left cavities of the heart are generally empty, or contain only a small quantity of blood; the auricle being partially and the ventricle completely and firmly contracted. The tissue of the lungs is, in most cases, of pale colour, dense in texture, and contains less than the usual amount of blood and air. With respect to the extremely anæmic condition of the lung, when death has occurred during the stage of collapse, there is an entire agreement amongst those authors who have most accurately described the

*post-mortem* appearances. There is something surprising, as Briquet and Mignot observe (*Traité Critique et Analytique du Cholera Morbus*), in the contrast between the almost constant occurrence of this extremely anæmic condition of the lung, from which scarcely even a few drops of blood flow when the tissue is cut, and the hyperæmia of most of the other viscera.

There is a remarkable contrast, too, between this anæmia of the lung when death has occurred during collapse, and the great engorgement of the lungs which is almost invariably found when death occurs in the febrile stage which often follows reaction.

Now, it is evident, from the appearances here described that, during the stage of collapse, there is an arrest of blood in the branches of the pulmonary artery before it has reached the pulmonary capillaries. The arrest at this point explains the remarkable anæmia of the texture of the lungs, while the hyperæmia of the lungs after reaction is due to engorgement of the pulmonary capillaries. Before I attempt to explain this remarkable arrest of blood, it may be well to allude briefly to certain phenomena in the living but collapsed patient which afford confirmatory evidence that the pulmonary circulation is greatly impeded. The impeded flow of blood through the lungs resulting, as it must, in a very scanty supply of blood to the arteries, accounts for the character of the pulse in cholera. It accounts, too, for the fact that the pulse has often been observed to increase in power and volume under the influence of venesection, which, by relieving the over-distension of the right cavities of the heart, increases their contractile power. (See Dr. Reid's essay, *On the Effects of Venesection in Renewing and Increasing the Heart's Action under Certain Circumstances*.)

Another appearance which receives explanation from the small stream of blood in the arteries, is that of the shrinking of the integuments, and especially the collapse of the features and the sinking of the eyeballs. The eyes of a patient in deep collapse are often as much sunk as those of a corpse and the chief cause of this, in the case of both the cholera-patient and the corpse, is the more or less complete emptiness of the branches of the ophthalmic artery.

That the arterial stream during collapse is reduced to a minimum, is proved by the fact that arteries of considerable size have

been opened during life without the escape of blood. Magendie states (*Léçons sur le Cholera Morbus*, p. 21) that on one occasion, he cut across the temporal artery of a patient in collapse and no blood escaped. ("Il ne s'écoula pas une goutte de liquide.") Scott says (*op. cit.*, p. 30) that the temporal artery has often been opened without the escape of blood. He also states that a surgeon, "despairing of other means, cut down upon the *brachial* artery; but so completely had the circulation failed, that no blood flowed."

While, therefore, the small and feeble pulse, the collapse of the features, and the occasional absence of hemorrhage from a wounded artery, are explicable on the supposition that the arteries receive a very scanty supply of blood, these phenomena afford evidence confirmatory of that derived from *post-mortem* appearances, that during the stage of collapse the passage of blood through the lungs is much impeded. It appears, therefore, that, during the stage of collapse, the blood which is sent into the pulmonary artery is, in great part, arrested in the minute branches of the artery before it reaches the capillaries of the lungs. What is the cause of this arrest of blood? Some writers have suggested that the blood has been rendered so thick by the loss of serum, that it cannot pass through the minute vessels. This theory is scarcely deserving of a moment's consideration. It is entirely at variance with the fact before referred to, that there is no direct relation between collapse and loss of fluid by the bowels; and, again, with the fact that the state of collapse passes off, while loss of fluid by purging continues, and while, therefore, the thickening of the blood which, according to this theory, has stopped its passage through the lungs, should be continually increasing. The suddenness with which collapse often occurs, is quite inexplicable by the theory that thickening of the blood through loss of its water is the cause of that condition. In illustration of the sudden occurrence of collapse, I may refer to the following passages in Sir William Burnett's Report on Cholera in the Black Sea Fleet in 1854. "The first to be attacked were men already on the list for diarrhoea, several of whom fell into a state of collapse one after the other; but, about the same time, robust healthy men, who had fallen suddenly down in a state of collapse, began to



be brought in from various parts of the ship, (the *Britannia*), even from the yards, where they were seized while reefing sails." And the surgeon on board the *Albion* reported that "the attacks in many instances were so sudden, that many men fell as if they had drunk the concentrated poison of the upas-tree." The supporters of this theory of blood-thickening as the cause of collapse would have us believe that, in the course of a few minutes, the blood of these robust men had become so thickened by loss of water as to be incapable of transmission through the minute vessels of the lungs. I shall hereafter show that the thickening of the blood is a *consequence* and not a *cause* of the arrest of blood in the pulmonary arteries.

I believe the true explanation of the arrest of blood in the lungs to be this. The blood contains a poison whose irritant action upon the muscular tissue is shown by the painful cramps which it occasions; the blood thus poisoned excites contraction of the muscular walls of the minute pulmonary arteries, the effect of which is to diminish, and in fatal cases entirely to arrest, the flow of blood through the lungs.

We have seen that the condition of the lungs after death during collapse affords conclusive evidence that the arrest of the blood occurs, not in the capillaries, but in the branches of the pulmonary artery, before the capillaries are reached by the blood. We know that the walls of the arteries are muscular, and that they have the power of contracting upon their contents under the influence of a stimulus, such as cold, electricity, or mechanical irritation. I suppose that no physiologist at the present day would deny that spasm of the arteries is as real a fact as spasm of the muscles.

Many experiments and observations prove that contraction of the muscular walls of the arteries has great influence on the passage of their contents. For instance, it is a well-known fact, that the tissues of an animal immediately after death cannot, without a force which endangers the integrity of the vessels, be injected with any of the fluids which are commonly used for that purpose. The coats of the arteries, so long as their vital tonicity remains, contract upon their strange contents, and impede the passage of the injection into the capillaries.

Nearly a century ago, Hales (*Statical*

*Essays*, 1769) performed some ingenious experiments to demonstrate the power which arteries possess to control the flow of various liquids through them. His experiments were performed on animals recently killed; and he found that, while warm water passed very readily through the arteries, cold water, decoction of bark, and brandy, passed much more slowly.

Some experiments performed by Blake (*Edinburgh Medical and Surgical Journal*, vols. liii., liv., and lvi.) on living animals bear upon this question. He found that a concentrated solution of a salt and soda, when injected into the jugular vein of a dog, killed the animal in less than a minute. On examination after death, the right side of the heart was found greatly distended, while the left contained only a little black blood. A few grains of nitrate of silver in solution destroyed life in precisely the same way. The passage of blood through the lungs is arrested, and the animal dies with the right cavities of the heart distended while the left cavities are nearly empty.

The sudden arrest of the flow of blood through the lungs in consequence of the accidental admission of air through a wounded vein in the neck or axilla has some relation to this subject. The entrance of air has usually been indicated by a peculiar gurgling sound in the wound, and the symptoms which rapidly follow are thus described. (Dr. John Reid's *Physiological, Anatomical, and Pathological Researches*, p. 553.) "Speedy occurrences of syncope, which is either preceded by a cry, with the expression, 'I die,' 'I am dead,' 'I suffocate,' or by anxiety and tremblings. Or, without any such precursors, the syncope rapidly reaches such a degree that all consciousness is lost, and the patient falls down; cold sweat breaks out on the forehead; and, in a quarter of an hour, sometimes sooner, sometimes later, he is dead." After death, both in the human subject and in animals that have been the subjects of experiments, the right side of the heart is found to be much distended with frothy blood; and the same mixture of air and blood is usually found in the pulmonary arteries. The left side of the heart is usually empty; but a small quantity of frothy blood is occasionally found in the left cavities and in the aorta. The cause of death in these cases is the distension of the right side of the heart, which results from the impeded

transit of frothy blood through the vessels of the lungs. Mr. Erichsen found, by experiments on a dog recently killed, that beaten bullock's blood, mixed with air, required nearly twice the pressure to drive it through the pulmonary vessels, that would suffice to drive unmixed blood through the lungs. (*Edinburgh Medical and Surgical Journal*, vol. lxi.)

I have referred to these experiments in illustration of the general principle: 1, that the movement of blood through the lungs may be quickly arrested by the addition of some foreign ingredient to the blood; and 2, that this arrest is probably due to the power which the arteries possess to contract upon their contents.

The proof that the blood is arrested during the stage of collapse in cholera is, as before stated, partly the anatomical condition of the lungs after death, partly the symptoms observed during life.

About two years since, I had under my care in the hospital a woman (S. B.) who was suffering from dropsy, the result of heart-disease of long standing. On going through the ward one afternoon, I saw her sitting up in bed as well as usual. In less than five minutes after I left her to go into another ward, I was sent for in consequence of her having become suddenly worse. I found her gasping for breath, cold and pulseless, with a blue and shrunken appearance of the features, exactly resembling the collapse of cholera. I at first thought that she would die in a few minutes; but she rallied in some degree, and lived forty-eight hours, during which time her dropical legs became rapidly gangrenous. We found, as I had predicted, that besides old standing disease of the mitral valve, there were firm fibrinous coagula in the branches of the pulmonary artery. The sudden obstruction of the pulmonary arteries by fibrin caused a state of collapse exactly resembling that of cholera. (*Hospital Case-book*, vol. xix. p. 59.)

The most interesting and conclusive evidence that arrest of blood in the lungs is the true key to the pathology of choleraic collapse, is to be found in the simple yet complete explanation which it affords of all the most striking chemical phenomena of the disease—the imperfect aëration of the blood, the fall of temperature, the dark and thickened appearance of the blood, and the suppression of bile and urine.

*Chemical consequences of the obstructed flow of blood through the pulmonary arteries.*

—It is obvious that the stream of blood from the pulmonary capillaries to the left side of the heart is the channel by which the supply of oxygen is introduced into the system. One necessary consequence, then, of a great diminution in the volume of blood transmitted to the left side of the heart, must be that the supply of oxygen is lessened in a corresponding degree. This position probably will not be disputed by any one who will give the subject a moment's consideration. Nor again can it be denied or doubted that certain results must of necessity follow this limited supply of oxygen.

The combustion of those constituents of the blood which are normally subjected to the action of oxygen will be diminished in proportion to the deficiency of that gas; and thence follows simultaneously and of necessity a reduction of temperature, and so scanty a formation of urinary and biliary constituents, that, while the state of collapse continues, the functions of the kidneys and liver are virtually suspended. The blood at the same time has that black, thick, treacly appearance which is not peculiar to the collapse of cholera, but which is common to it with all diseases which are attended with a defective aëration of the blood. The blood has this character during the cold stage of a severe ague fit. Dr. Mackintosh and others, who have bled patients during the cold stage of ague, describe the blood as flowing from the arm at first in a slowly trickling stream, being of a dark colour, and not coagulable. (See Mackintosh's *Practice of Physic*, vol. i. p. 86 *et seq.*) Dr. Dundas Thomson, who published an elaborate paper on the Chemistry of the Blood in Cholera (*Méd. Chir. Trans.*, vol. xxxii. p. 67), states that one specimen of blood from a "patient who laboured under the affection of the mucous membrane of the air-tubes," contained a greater excess of solids, in proportion to water, than he had found even in cholera-blood.

The blood in cholera is black and thick only during the stage of collapse; in other words, during the stage of pulmonary obstruction and defective aëration. This state of the blood bears no relation to the loss of water; it comes on when the loss of water has been very trifling; it passes off rapidly,

while loss of water by purging continues unchecked. It is simply a result of defective aëration, just as the thick and smoky flame of a lamp is a result of defective aëration.

The constituents of bile and urine and carbonic acid are all results of oxidation; none of them can be formed without a large supply of oxygen. Suppression of bile and urine during the stage of collapse is a necessary consequence of the limited supply of oxygen which results from the obstruction of the lungs. The amount of carbonic acid expired during collapse is also much diminished. (See, on this point particularly, Twining's *Clinical Illustrations*, etc., 2d ed. p. 15.) One fact confirmatory of the view that the very scanty formation of bile, urine and carbonic acid during collapse is a result of the diminished supply of oxygen, is, that the secretion of milk is apparently undiminished. I have myself observed this fact, and it has been mentioned by several authors.<sup>1</sup> Thus Magendie states that, one of his patients having been delivered of a child a few days before she was seized with cholera, the secretion of milk continued so abundant through a first and a second collapse, which ended fatally, that it was necessary to empty the breasts, in order to relieve the pain which their distension occasioned. Now, if the other secretions are suppressed on account of the deficiency of water in the blood, why does the secretion of milk continue? Magendie says, because the blood reaches the breasts, and supplies the materials for their secretion, on account of those glands being nearer to the heart than the liver and kidneys, which being at a greater distance, do not receive the supply of blood necessary for the discharge of their functions! My explanation of this remarkable and instructive fact is simply this. The chief constituents of milk—casein, sugar, oil, and water—may be obtained from the blood without the addition of oxygen. The secretion of milk, therefore, continues during the stage of collapse; while the highly oxygenized secretions are suspended, their essential constituents being formed only in

very minute quantities during that stage, on account of the defective supply of oxygen.

*Explanation of the great temporary relief resulting from the injection of a hot saline solution into the veins.*—No theory of collapse can be considered complete which does not give a satisfactory explanation of the great temporary benefit which immediately follows the injection of a hot saline solution into the veins. I have before referred to this subject; and I deferred my explanation until I had given some account of the phenomena of collapse.

I have adduced many facts and arguments in proof of the position that the essential cause of collapse is an arrest of blood in the lungs, occasioned by a spasmodic contraction of the muscular walls of the pulmonary arteries. If this be the actual cause of collapse, we might, *à priori*, expect that for a time it would be removed by the injection of a hot fluid into the veins. The temperature of the fluid injected by Dr. Mackintosh varied from 106° to 120°; but he states that "the good effects of the injection were rapid in proportion to the heat of the solution." (*Op. cit.*, vol. i. p. 365.) The hot fluid, rapidly mixing with the blood in the right side of the heart and in the pulmonary artery, would, as it were, dilute the poisoned blood and render it less irritating, just as diluents render the urine less irritating to an inflamed bladder or urethra. It is probable, however, that the chief action of the injection would be to relax the spasm of the minute arteries by its high temperature.<sup>1</sup> Thus, the impediment to the circulation being overcome, the blood rapidly flows on to the left side of the heart and the arteries, and the phenomena of collapse pass away with marvellous rapidity. The benefit, however, is of but short duration; for the primary cause of the impeded circulation—namely, the

<sup>1</sup> See on this point Magendie, *Leçons sur le Cholera Morbus*, 1832, p. 27; Dr. Hutchinson, *History and Observations on Asiatic Cholera in Brooklyn, New York*, in 1854, p. 10; Dr. Robertson, *Edinburgh Monthly Journal*, 1843, p. 393; and Dr. Gairdner, "On the Pathological Anatomy of Cholera," *Edinburgh Monthly Journal*, July, 1849.

<sup>1</sup> Dr. Parkes, who tried the injection in some cases, states that he did not see even the temporary vivifying effects which others describe. (*Op. cit.*, p. 219.) The probable reason of this is, that the temperature of his injection was too low. In one case, he says it did not exceed 98°; while in another it was "tepid." In the other cases, the temperature is not stated. I think, therefore, that Dr. Parkes's failure to do good by a tepid injection is confirmatory of my view, that the high temperature of the injection employed by Dr. Mackintosh and others had more influence than the mere mixture of water with the blood. I believe that the hottest room of the Turkish bath would quickly relax the spasm of the pulmonary arteries; and so, if it did not cause faintness, it might be a real help to recovery.

poisoned condition of the blood—being still in operation, and the originally hot solution being cooled down by its diffusion through the entire mass of the circulating blood, the stream of blood through the lungs will soon again be obstructed; and the patient thus passes into a state of collapse as profound as and more hopeless than before. It appears, therefore, that the hot saline injection into the veins, and the operation of venesection, when it rapidly relieves, as it often has done, the symptoms of collapse, have this effect in common, that they facilitate the passage of the blood through the lungs, and thus lessen that embarrassment of the pulmonary circulation which is the essential cause of choleraic collapse. But, whereas the hot injections act by removing the impediment which results from spasmodic contraction of the arteries, venesection acts by relieving over-distension of the right cavities of the heart, and thus increasing the contractile power of their walls.

In concluding this communication, I would implore those pathologists who have hitherto thought that the temporary benefit following injections into the veins affords conclusive evidence that collapse results from loss of water, to consider whether the explanation here offered is not at least as probable, as complete, as and consistent with all the known facts of the problem, as that which is commonly received.—*Brit. Med. Journ.*, Nov. 4th and 11th, 1865.

(To be continued.)

*Pettenkofer's Theory of the Mode of Propagation of Cholera.*—Dr. HERMANN WEBER read before the Epidemiological Society, Dec. 4, 1865, a paper based on Prof. Pettenkofer's last publication on the subject, "*Ueber die Verbreitungsart der Cholera*" (*Zeitschrift für Biologie*; Jahrgang, 1865, p. 323).

With regard to the question of contagiousness, Pettenkofer believes that the disease is propagated by human intercourse, and never without this; not by simple contact with the diseased or their excretions, according to the old theory of contagion, but by means of certain local accessory causes contained in the soil. Temperature, wind, moisture, or dryness of the atmosphere, and elevation of ground, are all not essential for the epidemic occurrence of cholera, although they may, under certain circumstances, exercise great influence on

its course. The only indispensable conditions are, *human intercourse yielding the germ in the excretions of cholera patients, and the soil developing this germ into activity.*

The qualities of the soil considered as necessary for the development of the cholera-germ are—1. That it be porous—i. e., permeable to air and water; 2. That water exist in a certain depth below the surface (ground-water or subsoil-water); and 3. That the soil be to some degree impregnated with the products of organic decomposition, especially those of excrementitious origin.

Respecting the first condition, Pettenkofer, and the members of the Bavarian Commission for the Investigation of Cholera in 1854, have found, without a single exception, that the soil in the towns and villages epidemically affected with cholera was porous; while localities built on impermeable rock were either entirely spared, or, at all events, exhibited only isolated cases. Several apparent exceptions were, on closer examination, found to confirm the law. The well-known researches of Boubée and Fourcault are in accordance with this law.

With regard to the presence of ground-water or subsoil water (landspring—"Grundwasser"—the first stratum of water reached at a certain depth below the surface, between about five and fifty feet), Pettenkofer points to the fact, generally acknowledged, that the cholera spreads with predilection along the course of rivers and in hollow situations; but he regards the water of the soil underneath the habitations as much more important than that of the more or less distant river; and maintains that, as a rule, those localities suffer more from cholera which lie nearer to the level of the ground-water, the distance of which from the surface may be regarded as depending on the first impermeable stratum of the soil. The fall of the impermeable stratum may be parallel to that of the surface, but is more usually not; if the former be greater than the latter, then elevation means greater distance from the ground-water, and probably greater immunity from cholera, but not otherwise. The level of the ground-water in the same locality may vary considerably in the same year and in different years; and on this fluctuation the varying degree of susceptibility of the locality for the cholera epidemics seems to depend. Under equal circum-



stances, the rise of the ground-water will cause a greater susceptibility by moistening a higher stratum of the porous soil, which is generally more impregnated with organic matters the nearer it is to the surface. It is the period of receding of the ground-water from its greatest elevation which is most dangerous. As this occurs usually in July, August, and September, cholera usually makes its greatest ravages at that period; but the unfavourable condition of the soil, may, through unusual circumstances, occur in winter instead of in summer; and cholera epidemics may, as experience shows, occur in the midst of a Russian winter.

With regard to the cholera-germ itself, Pettenkofer assumes it to be contained in the intestinal excreta of cholera patients, but believes that it cannot produce cholera by itself, but must first undergo some change under the influence of the susceptible soil, and thus become developed. This interchange between the cholera-germ contained in the excreta and the soil may, he suggests, either take place in the soil, and the developed germ may be thence inhaled or otherwise introduced into the body, or it may take place within the human body itself, the product being the active germ.

Pettenkofer adds hygienic suggestions for the prevention of epidemics, based on his views.

Dr. WEXER remarked that these views, though not yet altogether proved, were in accordance with the best ascertained facts, and deserved to be tested without loss of time. He added that the observations of the position and fluctuations of the ground-water might lead to other important discoveries, and alluded to the researches of Professor Buhl, of Munich, according to which the death-rate from typhoid fever, in Munich, was in intimate relation to the varying elevation of the ground-water in that town.—*Brit. Med. Journ.*, Dec. 16, 1865.

**Experimental Researches on Cholera.**—Several interesting experiments have been conducted upon animals by Herr Thiersch, of Munich, and M. Robin. The latter injected the vomited and excreted matter of cholera patients into the trachea and veins of two dogs, and to a third dog he administered the matter vomited by a fourth dog,

to which he had given the blood and serum of a cholera patient. In the three cases he observed the vomiting and other symptoms of cholera.—*Lancet*, Jan. 13, 1866.

**Albuminous Urine a Symptom of Cholera.**—M. DE WOUVES, in a memoir just published, has demonstrated that albumen is present in the urine of all cholera patients some days before the more serious symptoms exhibit themselves. He does not attribute this fact to any disease of the kidneys, but he regards it as an important means of distinguishing between true cholera and diarrhoea.—*Ibid.*

**Cholera Cures.**—The papers tell us that PROF. TOMMASI, of Naples, has been employing in cholera one of the remedies recommended by the *Times*, subcutaneous injections of quassia! And that M. Rubio has obtained very satisfactory results from hypodermic injections of essential oil of mustard. In Spain, some doctors have employed as a cure, ligaturing of the limbs "to intercept the circulation, and preserve the animal heat;" a practice described by *Siglo Medico* as a grand discovery. [!] In Constantinople, *L'Union Médicale* informs us that one of the remedies used by the doctors is to make the patient drink his urine when vomiting and diarrhoea begin. Another remedy, highly praised by Signor Bruno, is what may be called the bellows cure—the poking the nozzle of a bellows into the mouth or oesophagus of the patient and so insufflating him; the theory being that the cholera victim is dying for want of air. The quassia experiments are not spoken of by those who made them with any sanguine feeling; but then they console themselves with the reflection "that it is premature to form any opinion of experiments made on the decline of an epidemic."

A medical man, writing at Naples, says: "The malady is rapidly on the decline, though I fear we shall not get entirely rid of it for a long time to come. On the whole, we have not suffered so much as the filth and conglomeration entitled her to. The more I see of the disease the more certain I am that its ravages might be entirely prevented by a house to house visitation, and an early treatment of premonitory symptoms. As to the treatment, this epidemic has again taught us nothing; many old remedies have been brought

up anew, and puffed, such as quinine and quassia injections, chlorodyne and opium; but the result has been the same as in other epidemics—about 40 or 50 per cent. of mortality of the *declared* cases, while the mortality from subsequent typhoid fever has been the greatest in those cases that have been treated by violent remedies, and chiefly by opiates and alcoholic stimulants. The disinfectants used chiefly have been sulphate of iron for the excreta, while the rooms, bedding, furniture, etc., have been fumigated with chlorine gas. In the military hospitals the rule has been that no one left the hospital (of the medical and other attendants) before having remained a few minutes in a room exposed to these fumigations. The exemption of Sicily (and of Rome) up to the present time is certainly in favour of the *excommunicatory* system; but then, again, on the other side, Leghorn and Genoa have been exempted, though a quarantine of only a few days was insisted on. In addition to this, it may be observed that the islands in the Bay, which, from their position are cut off from close communication with Naples, have not been afflicted except in one or two cases, which were evidently carried over from the city."

Our readers will note in the above a confirmation of the views of Dr. G. Johnson. We are told that "the mortality from subsequent typhoid was greatest in those cases that had been treated by violent remedies, and chiefly by opiates and alcoholic stimulants.—*Brit. Med. Journ.*, Dec. 16, 1865.

**Cholera in Paris.**—In the final report of the sanitary department of the "Préfecture de Police" it is stated that the total number of deaths from the recent epidemic of cholera amounted to 6,383.

There has been no fatal cases since the 14th of January.

## CLINICS.

### CLINICAL LECTURES.

**Clinical Remarks on Locomotive Ataxy.**—Two cases of locomotive ataxia treated in the Aberdeen Royal Infirmary by iodide of potassium with partial benefit, are reported in the *Med. Times & Gaz.*, Jan. 20, 1866, with the following interesting clinical remarks on this very unmanageable affection:—

"Locomotive ataxy is commonly mistaken for paraplegia. The features of each are so distinct that it is surprising physicians did not sooner recognise the difference. Duchenne's vague definition of locomotive ataxy is, 'Progressive abolition of the co-ordination of movement, and apparent paralysis, contrasting with integrity of muscular power; these are the fundamental characters of the disease.' Trousseau's is more definite, but commits science to what is yet but theory—'A spasmodic neurosis characterized by a want of co-ordination of the voluntary movements, often complicated with disorders of sensibility and partial paralysis.' The chief feature of the disease, when fully formed, is more or less inability to perform the reflex functions of standing or walking. On attempting to walk the patient finds his legs refusing to obey the ordinary co-ordinating power; they are thrust outwards or forwards spasmodically, and planted on the ground in an irregular way beyond the control of the individual, who is in constant danger of losing his equilibrium. If he succeeds in getting a start he moves forward in a precipitate manner, staggering and stumbling, and is obliged to use a staff to prevent himself from falling. A paraplegic patient, on the other hand, if able to assume the erect posture, drags his legs slowly, but uniformly along, his difficulty being not to control the movements of his legs, but to get them to move at all. The most characteristic differences between locomotive ataxy and paraplegia are the following: First, *in bed*, the patient with the former affection has complete power over the voluntary movements of the legs, as was well seen in the two cases recorded, both of whom tossed about their legs with the utmost facility, and defying all attempts to hold them, while in paraplegia the power of voluntary motion is in a greater or less degree lost; secondly, in locomotive ataxy, if the eyes be shut, the patient can no more walk or even stand, with his feet together than a person can stand or walk on stilts who has never been accustomed to them, while nothing similar is observed in paraplegia, or indeed any other kind of paralysis. In fact, a patient with ataxy closely resembles a tyro endeavouring to walk upon stilts. These diagnostic marks are, therefore, very important, and ought not to be overlooked. "Locomotive ataxy seldom comes on

without premonitory symptoms. The chief of these are rheumatic pains, partial and temporary attacks of paralysis, and disorders of urinary and generative organs. The pains are irregular, coming and going, and are generally mistaken for rheumatism. They were so in the girl S—; but that they were not rheumatic was at once evident from the fact that they were confined to one knee and ankle—a point of some importance, for rheumatic pains of this kind are mostly due to lesion of the nervous system. There does not appear to have been any other premonitory symptom in this girl, except amaurosis, which was, however, but slight, and the excessive pain on the one side of the head. Amaurosis is a very common symptom, as also paralysis of the third and sixth nerves, and indeed of any nerve. The paralysis of the ocular nerves is, in general, more persistent than that of others. Transitory attacks even of hemiplegia may occur, and it is singular that the father of the girl S— was thus affected, although there is no history of ataxy in him. The premonitory symptoms in the man M— were partial paralysis of the left facial nerve, and at one time what looks very much like incontinence of urine. He also had cutaneous anesthesia, which is a frequent attendant on the disease.

"The usual post-mortem appearances found after death in these cases are gray degeneration of the posterior columns of the spinal cord, and atrophy of the posterior roots of the spinal nerves. So long as the posterior columns were believed to be the channel for the transmission of sensitive impressions to the brain, this state of parts existing with little or no loss of sensation, but with loss of the reflex power of standing and walking, was rather perplexing, especially as the anterior columns were free from disease; but since the experiments of Brown-Séquard have shown that the posterior columns have not the office formerly assigned to them, and moreover that section of them causes hyperæsthesia, instead of anesthesia, together with locomotive ataxy, the pathology is more intelligible. But how does it happen that with atrophy of the posterior roots there is often little or no loss of sensation? The explanation given is, that the hyperæsthesia which would be produced by disease of the posterior columns alone is counteracted by the atrophy of the posterior roots, in which some nerve tubes remain

intact, sufficient to account for the persistence of sensation. This may be true, but it is not quite satisfactory. It is to be regretted that the state of the sympathetic nerve has not received the attention it deserves. There seems evidence to show that that nerve has more to do with reflex motion than has generally been supposed. Last year M. Voisin presented to the Société de Médecine of Paris a case of locomotive ataxy of the upper extremities where the cervical sympathetics were found diseased.

"An attempt has been made to distinguish locomotive ataxy caused by disease of the posterior columns from that caused by cerebellar disease. I am afraid this will be found impossible in practice, at least in many cases. It may be possible to diagnose the locality of the lesion, whether in the cerebellum or in the spinal cord; but that both varieties belong to the same category I have no doubt. For, in ataxy from spinal disease, we also find sometimes structural change in the optic nerve, the optic tract, the corpora quadrigemina, and the motor oculi, without disease in the cerebellum; and yet in some cases of so-called ataxy, the only lesion found has been cerebellar. The ataxy likewise is not confined to the legs, but may proceed to the upper extremities, or even affect them solely, as in Voisin's case just mentioned. The cerebellar and spinal disease are, therefore, probably varieties of the same evil, the ataxy being the symptom. And here I may be permitted to quote some observations of Dr. Hughlings Jackson. Speaking of cases of paralysis of one or more cranial nerves, with paralysis of both legs, and no paralysis of the arms, except now and then a little paralysis of the hands or fingers, he says: 'One of three inferences may be drawn from these facts. 1. The symptoms may by some be considered to occur together by a coincidence. 2. That the paralysis of the cranial nerve is the result of reflex action, set up by the disease of the cord which produces the paraplegia. This is the explanation given by Dr. Brown-Séquard. 3. That there is a tract in the higher part of the nervous system which contains nerve-fibres from the legs and not from the arms, or, at least, only from the fingers or hands. Some of these cases resemble, and perhaps are locomotive ataxie. There is in some a loss of power in walking

properly, whilst the legs seem to retain considerable power. This, of course, applies only to those whose sight is merely impaired. When the guiding power in the legs is lost, we use the eyes to direct our movements. Even in health 'we lean,' says a distinguished physiologist, 'on our eyesight as on crutches.' Patients who have ataxie, therefore, cannot walk in the dark, or when their eyes are shut. Blindness, following loss of guiding power in the legs, seems then to be not so much a complication as the loss of a similar faculty. But, when the patient has lost both these helps to guide himself, it is just possible that he may struggle his way from object to object by touch. But a third factor in the general power to guide movements is frequently affected also, there is numbness of the fingers; so that the power to combine movements in the legs, or to do so in a supplementary way by help of the eyes, or of touch, is lost altogether. This, I think, renders it plausible that there may be in the higher parts of the nervous system a tract of nerve fibres passing from the legs, fingers (tips) to the corpora quadrigemina for the general purpose of guiding movements in progression.

"The prognosis of locomotive ataxy is bad. Patients, if they do mend for a little time, mostly go from bad to worse till they can no longer maintain themselves in the erect posture, and die cachectic. Various remedies have been tried. Electricity and nitrate of silver are favourite remedies with some, but not much confidence can be placed in them. There is this comfort, that the disease may remain stationary for many years."

## MEDICAL NEWS.

### DOMESTIC INTELLIGENCE.

*Mütter Pathological Museum of the College of Physicians.*—We would invite the attention of the profession to the following circular issued a short time since by the committee having this museum in charge:—

HALL OF THE COLLEGE OF PHYSICIANS,  
N. E. corner Thirteenth and Locust Sts.

The Museum Committee of the College of Physicians having in charge the Pathological Museum of the late Dr. MUTTER, desire to add to it such Anatomical and Pathological specimens of interest as are

now in the hands of physicians, or such as may be met with in their practice.

The Committee, therefore, solicit donations, which in every instance should be accompanied by a history of the case, or a reference to a medical journal containing such record. All interesting specimens presented to the College will be labelled with the donor's name, and placed in the Museum for permanent preservation.

Specimens addressed to the Curator may at any time be sent to the Hall of the College of Physicians.

J. R. PAUL, M. D.,

WM. HUNT, M. D.,

S. WEIR MITCHELL, M. D.,

THOMAS G. MORTON, M. D., Curator.

PHILADELPHIA, NOV. 1863.

} Committee.

*Philadelphia County Medical Society.*—

At the annual meeting, held on the 17th day of January, ult., the following officers and delegates were duly elected:—

*President*, Dr. William Mayburry.

*Vice-Presidents*, Drs. Robert Burns and William L. Knight.

*Recording Secretary*, Dr. Wm. B. Atkinson.

*Assistant Recording Secretary*, Dr. A. Y. Evans.

*Corresponding Secretary*, Dr. Henry St. Clair Ash.

*Treasurer*, Dr. Andrew Nebinger.

*Censor*, A. H. Fish.

*Delegates to the American Medical Association.*—Drs. H. St. Clair Ash, W. L. Atlee, Robert Burns, C. S. Boker. A. Cheeseman, James M. Corae, David Gilbert, N. L. Hatfield, George Hamilton, Wilson Jewell, Wm. L. Knight, Jas. J. Levick, Wm. Mayburry, Andrew Nebinger, Winthrop Sargent, E. B. Shapleigh.

The delegates to the American Medical Association from the Medical Society of the State of Pennsylvania who are members of the Philadelphia County Medical Society are: Dr. L. P. Gebhard and Dr. J. Henry Smalts.

*Delegates to the Medical Society of the State of Pennsylvania.*—Drs. H. St. Clair Ash, W. L. Atlee, C. S. Boker, Jno. Bell, W. H. Bunn, James M. Corae, Joseph R. Coad, R. J. Dunglison, H. Y. Evans, Lewis P. Gebhard, A. W. Griffiths, Thomas Hay, A. G. B. Hinkle, H. Lenox Hodge, Wilson Jewell, A. L. Kennedy, J. F. Lamb, Joseph Leidy, R. H. Lee, A. S. McMurray,



A. Nebinger, B. Price, W. M. L. Rickards, W. Sargent, A. M. Slocum, L. S. Somers, J. H. Smaltz, J. G. Stetler, S. N. Troth, L. Turnbull, Ellerslie Wallace, Charles F. Wittig.

The following is a list of the *ex-officio* delegates from Philadelphia to the medical society of the State of Pennsylvania: Drs. W. B. Atkinson, D. Francis Condie, A. H. Fish, N. L. Hatfield, William Mayburry.

**Jefferson Medical College.**—The catalogue of this school shows that the number of medical students in attendance on the lectures during the session of 1865-6 was 423.

**Harvard University.**—A chair of comparative anatomy has recently been established in the Medical Department of this University, and Prof. Jeffries Wyman, one of the most accomplished and erudite anatomists in this country, has been appointed to fill it.

**Medical Journalism.**—Medical journals are starting up in this country with astonishing rapidity. We have already received five new journals, viz: "The Richmond Medical Journal;" "The Savannah Journal of Medicine;" "The Medical Record," published in New York city; "The Cincinnati Journal of Medicine;" and "The Galveston Medical Journal." The announcement of five others, proposed to be published, have been sent to us, viz: "The Detroit Review of Medicine and Pharmacy;" one at Indianapolis, the title of which is not given; "The New Orleans Medical Journal;" "The Atlanta Medical Journal;" and "The Medical and Surgical Journal," (Memphis, Tenn).

Whether this is a propitious period for such a rapid multiplication of journals, or the profession are rich enough to furnish them material support, time can best determine.

Without wishing to repress the ardour of the projectors of these enterprises, we may state the fact that in the most prosperous times not more than two or three journals ever received sufficient literary or pecuniary support, and we can only express the hope that it may prove otherwise at present.

**OBITUARY RECORD.**—It is with profound regret that we record the death of Lieut. Col. RICHARD H. COOLIDGE, M.D., lately

one of the Medical Inspectors U. S. A. and, at the time of his death, Medical Director of the Department of North Carolina. This sad event occurred at Raleigh, N. C. on the 23d of January, 1866. Dr. C. was one of the oldest surgeons of the regular army, having been in the service a period of upwards of twenty-five years. For many years he was on duty in the Surgeon General's office, during which period he compiled two large volumes of Army Medical Statistics, and a large volume entitled "Army Meteorological Register," embracing the observations made during twelve years by the medical officers at the different military posts of the United States. Those works display remarkable industry, intelligence, and judgment. By his death the service has lost one of its brightest ornaments. He was a gentleman of highly cultivated mind, a lofty sense of honour, great courtesy and modesty, amiable, charitable, and devoted to his profession and to the service. He was stationed for two years in Philadelphia, where his social qualities, his courtesy, integrity, and highly cultivated mind made warm friends of all who had the privilege of his acquaintance.

## FOREIGN INTELLIGENCE.

**Death from Chloroform.**—Another death from chloroform has occurred: it was at St. Mary's Hospital. The patient was an apparently healthy man, and the operation was evulsion of the nail. Chloroform was administered on a handkerchief; all the proper precautions had been taken.—*Lancet*, Jan. 27, 1866.

**Extensive Employment of Chloroform.**—Prof. Simpson states (*Med. Times & Gaz.*, Dec. 16, 1865) that Messrs. Duneau, Flockart & Co., of Edinburgh, now make upwards of 7,000 doses of chloroform every day, counting two drachms as a full dose, or nearly 2,500,000 doses a year.

**Etherization.**—M. Velpeau has communicated to the Academy some remarks of M. Pétrequin, of Lyons, about etherization. Ether, employed by Dr. Jackson in 1846, was replaced by chloroform in 1849. Chloroform, as a chemical body, was discovered by M. M. Soubeiran and Pelouze; and its physiological action was tried for the first time by M. Flourens. But, if chloroform

acts more rapidly than ether as an anæsthetic, it is also more destructive in its effects; and consequently surgeons in the south of France never employ it. M. Buisson, in a work which received a recompense from the Academy some years ago, wrote against chloroform—an agent “wonderful and terrible,” as Flourens said of it. M. Pérequin now tells us that for fifteen years the surgeons of Lyons have employed ether only, and that they have never lost a patient. M. Velpeau hereon observed, that fatal accidents had been much more frequent abroad, and especially in England, than in France, and in the departments of France than in Paris. Much, therefore, depends upon the care with which chloroform is used. He had himself put thousands of patients under chloroform, and had never met with the slightest accident.—*Brit. Med. Journ.*, Jan. 6, 1866.

#### *Contractile Cells of Syphilitic Pustules.*

—It has been pointed out by Herr Szabad-földy that the cells removed from syphilitic pustules exhibit peculiar movements like those of the amœba and other protozoa. In many cases the projected processes become so numerous that the cell has the appearance of being clothed with cilia. Round cells frequently became oval, and underwent many other changes of form. In some, an internal molecular movement was distinctly seen.—*Lancet*, Jan. 13, 1866.

#### *Inoculation of Tuberculous Matter.*—M.

VILLEMIN informs the Academy of Sciences that, by means of inoculation of tuberculous matter taken from man, he has produced tubercular disease in rabbits. Softened tubercle was inserted under the skin near the ear of the rabbit; and, in the course of six or eight weeks, tubercles visible to the naked eye were found in the lungs, mesentery, intestines, etc., of the rabbit. The experiment has been successfully repeated a great number of times, and under different conditions.—*Brit. Med. Journ.*, Jan. 6, 1866.

*Influence of Water in the Production of Milk.*—M. DANCÉL has noticed that women, when suckling, drink a great deal more than at other times. Cows, too, before they drop a calf, will be satisfied with from 12 to 20 quarts of water a day, but afterwards they require 30, 40, or 50 quarts. He notices also

that cows fed in houses on dry food give a fourth or even a third less milk than when at pasture. He states, too, that cows fed upon dry sesame-cake gave very little milk until they were freely supplied with water. He concludes from all this that water has a good deal to do with the secretion of milk.—*Chemical News*.

#### *Production of Organisms in Closed Vessels.*—Dr. CHILD has come to the conclusion that there is no doubt of the fact that bacteria can be produced in hermetically sealed vessels containing an infusion of organic matter, whether animal or vegetable, though supplied only with air which has passed through a red-hot tube, and though the infusion be thoroughly boiled. The germ of bacterium must therefore be either capable of resisting the boiling temperature of a fluid, or they are spontaneously generated, or they are not organisms at all. Dr. Child is convinced that they are minute vegetable forms; and says that Powell and Lealand's fiftieth digestive has already shown something like an appearance of structure in these minute bacteria, which leaves no doubt about their organic character.—*Quar. Journ. of Science*, July, 1865.

*Muscular Power of Insects.*—M. PLATEAU, in a communication to the Académie des Sciences, observes that, believing the muscular power of the invertebrata has not sufficiently attracted the notice of physiologists, he has instituted a series of experiments upon insects, from which he draws these conclusions: 1. Independently of their power of flight, insects possess, in relation to their weight, enormous power, as compared with the vertebrata. Thus, while a powerful horse can only exert during some instants an amount of traction effort equivalent to about two-thirds of its own weight, the common cockchafer will exert a traction equal to fourteen times its weight. This amount of power is also considerably less than that possessed by other of the coleoptera, the most vigorous of these upon which the experiments have been yet tried being the *donacia nympha*, which exerts traction power equivalent to forty-two times its weight. 2. When we compare two species of insects of the same group which differ notably in weight, it is the smallest and lightest which exhibits the greatest proportionate power. 3. These results are not

due to the muscles being relatively more voluminous in the smaller animals, but to their being endowed with a greater energy and muscular activity.—*Med. Times and Gaz.*, Jan. 13, 1866.

**Action of Light on Animal Matter.**—Some novel experiments have been lately described before the Chemical Society of Paris, by M. JODIN, illustrating the action of light on vegetable matter. The author destroys the vitality of green leaves by immersing them in alcohol, or heating them to a high temperature in sealed tubes, and finds that after this the leaves still present some signs of life. In the light they are rapidly decolorized, but excluded from air and light they preserve their greenness for an indefinite time. In the course of the decoloration by solar light, he proves that oxygen was absorbed and carbonic acid evolved. Under the same circumstances he finds the yellow matter in etiolated leaves to absorb oxygen. On the contrary, it is proved that etiolated leaves, in becoming green in the light, evolve oxygen, while those kept in the dark and unchanged in color absorb oxygen. The author is disposed to regard chlorophyll as a body quite distinct from the yellow colouring matter of leaves.—*Quar. Journ. of Science*.

**Cinchona Plantations in Bengal.**—The last report on the cultivation of cinchona in Bengal states that during the months of July last, 14,000 cuttings were planted, a greater number than has ever been obtained at Darjeeling. The total number of plants, cuttings and seedlings amounts to 81,000. The altitudes at which the plantations are situated varies from 1825 feet to 5500 feet above the sea level.—*Lancet*, Jan. 13, 1866.

**Indian Cinchona Bark.**—Mr. M'IVER has analyzed the cinchona bark grown in India, and does not appear to report very favourably of its percentage of quinia. He recommends the medical profession to try the cinchonidine, an alkaloid largely present in the Indian specimens.

**Railway Surgery.**—The guards of the trains on the Swedish railways are required to have a knowledge of the elements of surgery, that, in the case of accidents, they may be able to render medical assistance. An ambulance, fitted up with every requisite, forms part of each train.

**Honours to Medical Men.**—The Queen of Great Britain has conferred the dignity of Baronetcy upon WILLIAM FERGUSSON, the eminent surgeon of London; upon Dr. DOMINICK CORRIGAN, formerly President of the Royal College of Physicians of Ireland, and one of the most distinguished physicians of Dublin; and upon Professor JAMES Y. SIMPSON, of Edinburgh, who has well earned any distinction that may be conferred upon him.

**OBITUARY RECORD.**—The Vienna journals announce the death of Professor Schuh. Whilst in perfect health, he was suddenly struck down by virulent typhus. He was buried on Christmas Eve, after an illness of only five days. The death of this highly esteemed man appears to have made a great sensation amongst his medical brethren. The *Wiener Medizinische Wochenschrift* speaks of him as "one of the best and noblest men we ever knew—a kind physician; an excellent teacher, full of learning; an indefatigable worker; a friend inspired with a love of all that is beautiful and true in art and in life; a man whose loss is irreparable, and over whose memory we shall mourn as long as we are here to mourn." Many thousand friends attended his funeral. The whole of the professors of the Medical Faculty were there, besides many professors of the other faculties. All the students of medicine, with the Hungarians in national costume, bearing torches, were present. It is mentioned as a remarkable fact, that the well-known operator, Kern, Schuh's predecessor, also died on the 23d, and was buried on the 24th of December.—*Brit. Med. Journ.*, Jan. 6, 1866.

Died, in January last, at Magdeburg, Dr. Julius von dem Fischweiler, at the advanced age of 109.

— On the 13th Jan., at Ryde, Isle of Wight, aged 74, Sir John McGregor, K. C. B., Deputy Inspector General.

— At Pisa, Italy, Jan. 17, aged 72, Sir John Hall, M. D., K. C. B., &c.

— At Edinburgh, Jan. 14th, 1866, Dr. DAVID JAMES SIMPSON, eldest son of Prof. J. Y. Simpson, aged 24 years. This young physician had given the highest promise of future distinction and usefulness, and had already proved himself worthy of the name he bore. The whole profession in this country, as well as in Great Britain, will deeply sympathize with his eminent father in his very sad bereavement.

**ROBERTS ON URINARY DISEASES—Now Ready.**

**A PRACTICAL TREATISE ON  
URINARY AND RENAL DISEASES,  
INCLUDING URINARY DEPOSITS.**

**ILLUSTRATED BY NUMEROUS CASES AND ENGRAVINGS.**

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The want has for some time been felt of a work which should render accessible to the American profession in a compendious and convenient form, the results of the numerous and important researches which have of late years elucidated the pathology of Urinary and Renal Diseases. It has been the aim of the author in the present volume to set forth in a form divested of undue technicality, the practical condition of the subject in its most advanced stage of progress. In endeavoring to accomplish this, he has refrained from crowding the volume with minute chemical and physiological details, which would unfit it for its object of affording to the physician a guide in his daily practice, and to the student a condensed and intelligible compendium of all that is practically important on the subject. To aid in this, numerous cases and illustrations have been introduced throughout the work.

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**IV. Organic Deposits—Pigmentary Particles—Extra-renal Epithelium—Renal Epithelium—Fatty Matter—Pus—Blood—Cancerous and Tuberculous Matter—Spermatozoa—Conferoid Vegetations—Albumen—Sugar.**

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